

PC3H41x NIP Series PC3Q410 NIP

■ Features

1. Low input current type ($I_F = \pm 0.5\text{mA}$)
2. High resistance to noise due to high common rejection voltage (CMR:MIN. $10\text{kV}/\mu\text{s}$)
3. AC input type
4. Mini-flat package **PC3H41x NIP Series** (1ch)
PC3Q410 NIP (4ch)
5. Isolation voltage (Viso: 2.5kVrms)
6. Recognized by UL, file No. E64380

■ Applications

1. Programmable controllers
2. Facsimiles
3. Telephones

■ Rank Table

Model No.	Rank mark	I_c (mA)	Conditions
PC3H410NIP	A or no mark	0.25 to 2.0	$I_F = \pm 0.5\text{mA}$ $V_{CE} = 5\text{V}$ $T_a = 25^\circ\text{C}$
PC3H411NIP	A	0.5 to 1.5	
Model No.	Rank mark	I_c (mA)	Conditions
PC3Q410NIP	No mark	0.25 to 2.0	$I_F = \pm 0.5\text{mA}$ $V_{CE} = 5\text{V}$ $T_a = 25^\circ\text{C}$

■ Absolute Maximum Ratings (Ta=25°C)

	Parameter	Symbol	Rating	Unit
Input	Forward current	I_F	± 10	mA
	*1 Peak forward current	I_{FM}	± 200	mA
	Power dissipation	P	15	mW
Output	Collector-emitter voltage	V_{CEO}	70	V
	Emitter-collector voltage	V_{ECO}	6	V
	Collector current	I_c	50	mA
	Collector power dissipation	P_c	150	mW
	Total power dissipation	P_{tot}	170	mW
	Operating temperature	T_{opr}	-30 to $+100$	$^\circ\text{C}$
	Storage temperature	T_{stg}	-40 to $+125$	$^\circ\text{C}$
	*2 Isolation voltage	V_{iso}	2.5	kVrms
	*3 Soldering temperature	T_{sol}	260	$^\circ\text{C}$

*1 Pulse width $\leq 100\mu\text{s}$, Duty ratio = 0.001

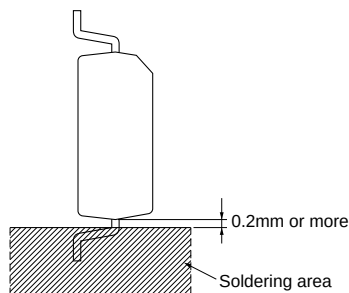
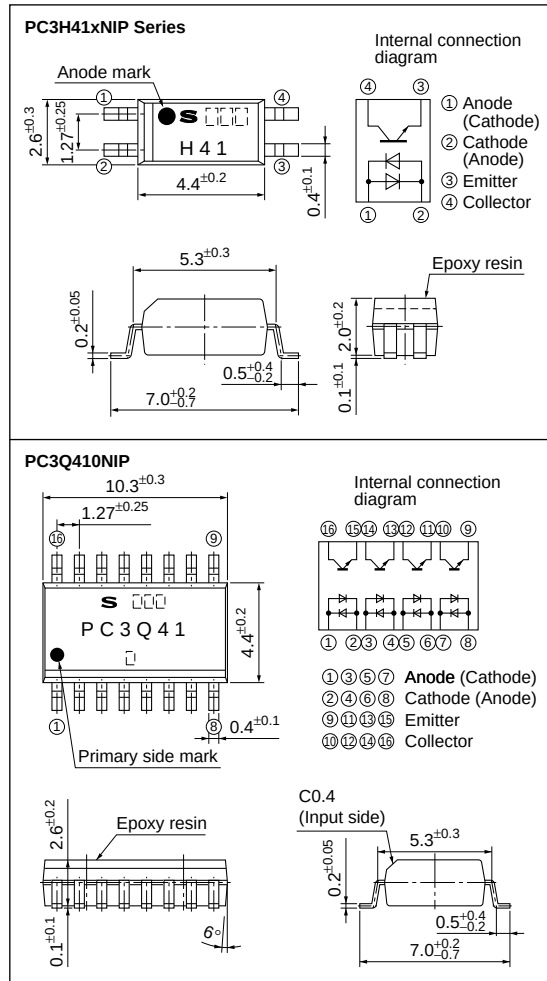
*2 40 to 60%RH, AC for 1 minute, $f = 60\text{Hz}$

*3 For 10s

AC Input, Low Input Current Type Photocoupler

■ Outline Dimensions

(Unit : mm)



Electro-optical Characteristics

(Ta=25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	V_F	$I_F=\pm 10\text{mA}$	—	1.2	1.4	V
	Terminal capacitance	C_t	$V=0, f=1\text{kHz}$	—	30	250	pF
Output	Collector dark current	I_{CEO}	$V_{CE}=50\text{V}, I_F=0$	—	—	100	nA
	Collector-emitter breakdown voltage	BV_{CEO}	$I_C=0.1\text{mA}, I_F=0$	70	—	—	V
	Emitter-collector breakdown voltage	BV_{ECO}	$I_E=10\mu\text{A}, I_F=0$	6	—	—	V
Transfer characteristics	Collector current	I_C	$I_F=\pm 0.5\text{mA}, V_{CE}=5\text{V}$	0.25	—	2.0	mA
	Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_F=\pm 10\text{mA}, I_C=1\text{mA}$	—	—	0.2	V
	Isolation resistance	R_{ISO}	DC500V 40 to 60%RH	5×10^{10}	10^{11}	—	Ω
	Floating capacitance	C_f	$V=0, f=1\text{MHz}$	—	0.6	1.0	pF
	Response time	Rise time	$V_{CE}=2\text{V}, I_C=2\text{mA}, R_L=100\Omega$	—	4	18	μs
		Fall time		—	3	18	μs
	*1 Common mode rejection voltage	CMR	$T_a=25^\circ\text{C}, R_L=470\Omega, V_{CM}=1.5\text{kV (peak)}, I_F=0\text{mA}, V_{CC}=9\text{V}, V_{np}=100\text{mV}$	10	—	—	kV/ μs

*1 Refer to Fig.1.

Fig.1 Test Circuit for Common Mode Rejection Voltage

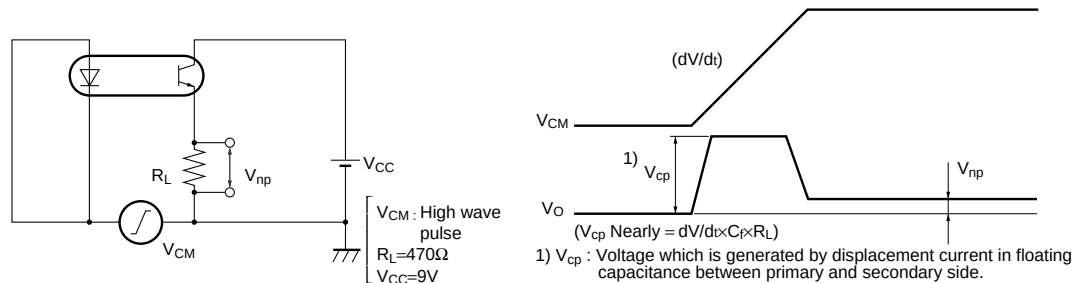


Fig.2 Forward Current vs. Ambient Temperature

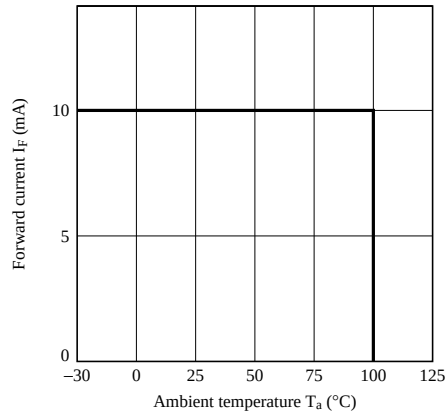


Fig.3 Diode Power Dissipation vs. Ambient Temperature

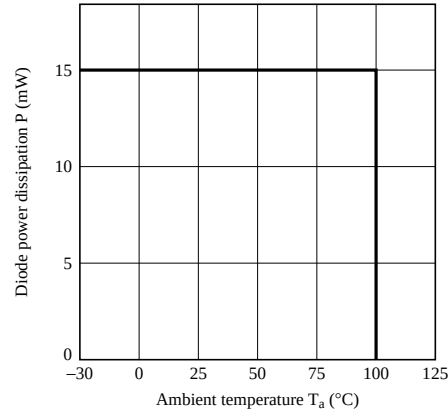


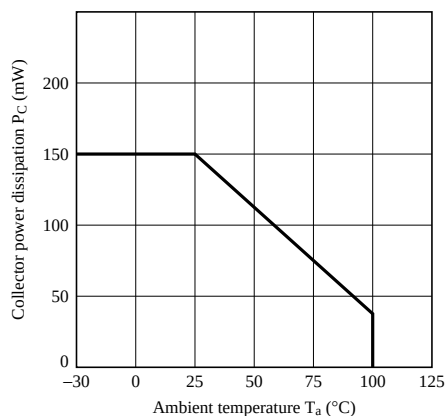
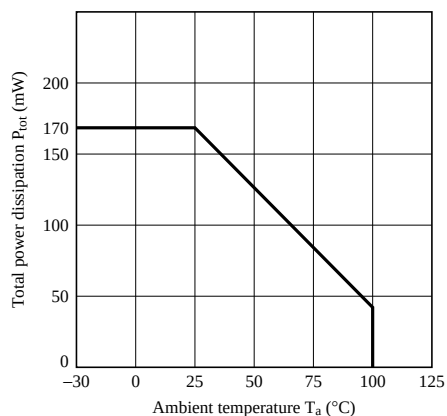
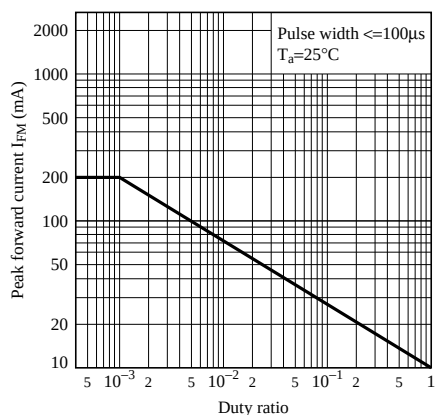
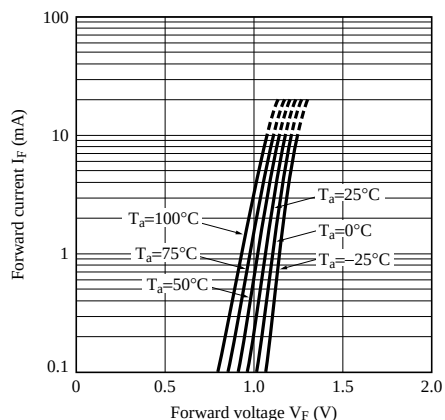
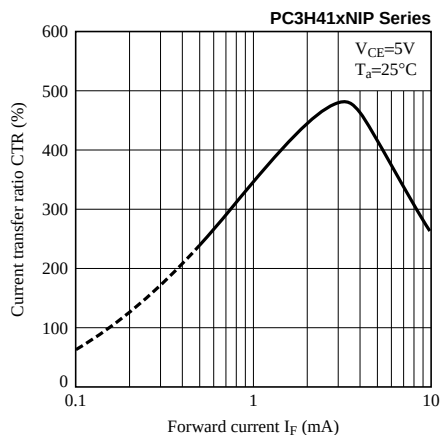
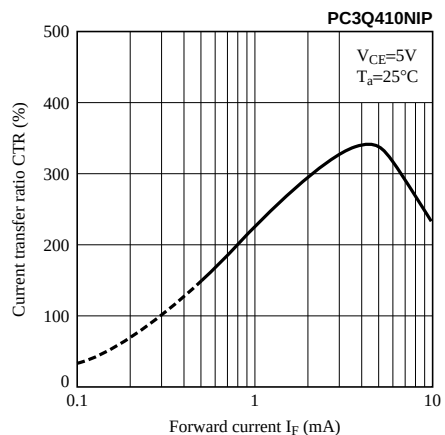
Fig.4 Collector Power Dissipation vs. Ambient Temperature**Fig.5 Total Power Dissipation vs. Ambient Temperature****Fig.6 Peak Forward Current vs. Duty Ratio****Fig.7 Forward Current vs. Forward Voltage****Fig.8 Current Transfer Ratio vs. Forward Current****Fig.9 Current Transfer Ratio vs. Forward Current**

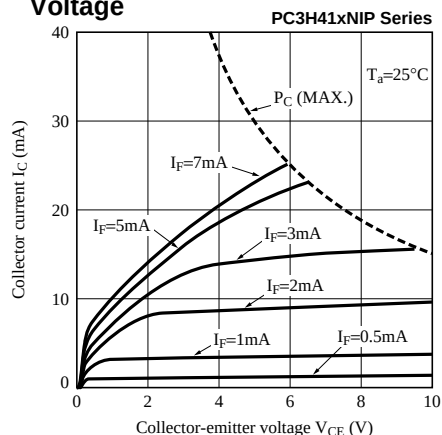
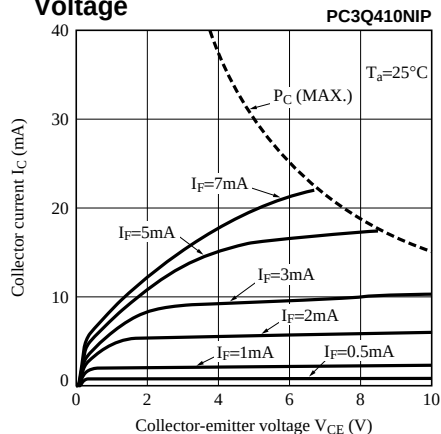
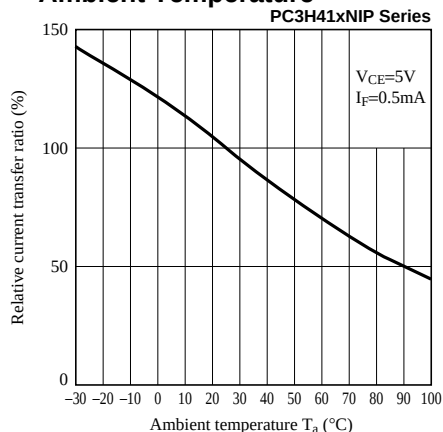
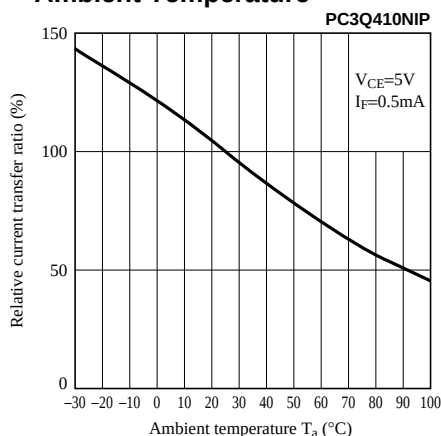
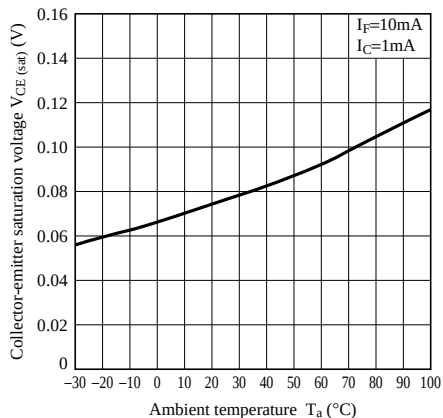
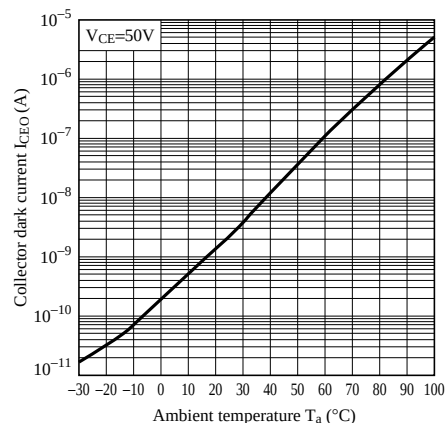
Fig.10 Collector Current vs. Collector-emitter Voltage**Fig.11 Collector Current vs. Collector-emitter Voltage****Fig.12 Relative Current Transfer Ratio vs. Ambient Temperature****Fig.13 Relative Current Transfer Ratio vs. Ambient Temperature****Fig.14 Collector - emitter Saturation Voltage vs. Ambient Temperature****Fig.15 Collector Dark Current vs. Ambient Temperature**

Fig.16 Response Time vs. Load Resistance

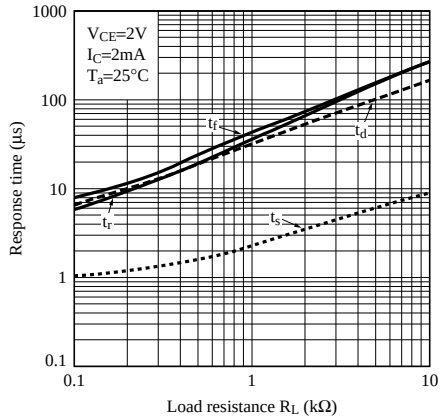


Fig.17 Response Time vs. Load Resistance (Saturation)

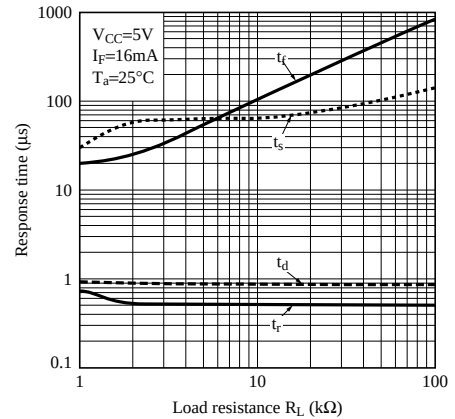


Fig.18 Test Circuit for Response Time

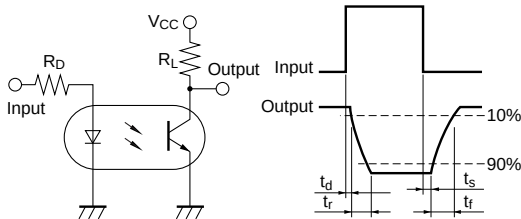


Fig.19 Voltage Gain vs Frequency

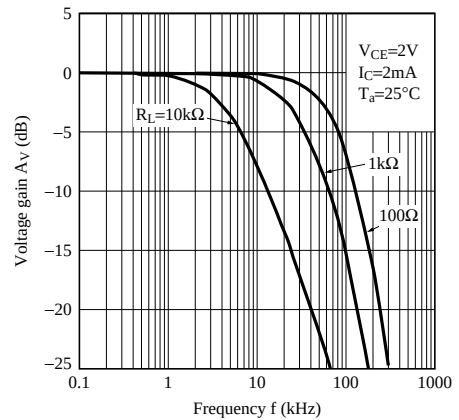


Fig.20 Collector-emitter Saturation Voltage vs. Forward Current

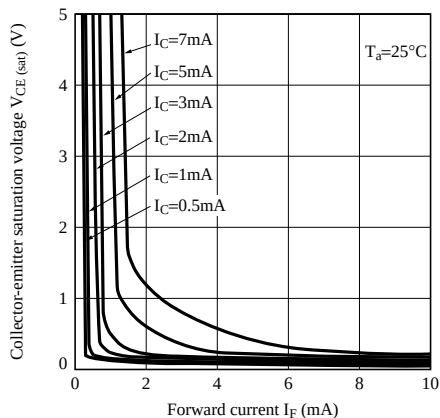


Fig.21 Reflow Soldering

Only one time soldering is recommended within the temperature profile shown below.

